

MULTIPLE COMPACT DISC PLAYER

# DP-R49

## SERVICE MANUAL

(MIDI M-29M/M-49M/M-686M)

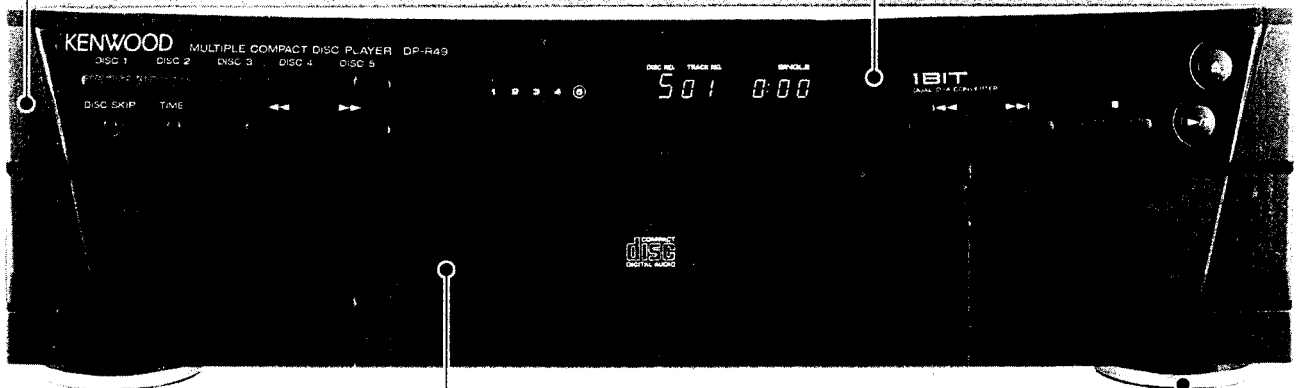
# KENWOOD

© 1995-7 PRINTED IN KOREA  
B51-5087-00 (K) 2770

Panel  
(A60-0755-01)

Metallic cabinet  
(A01-3252-01)

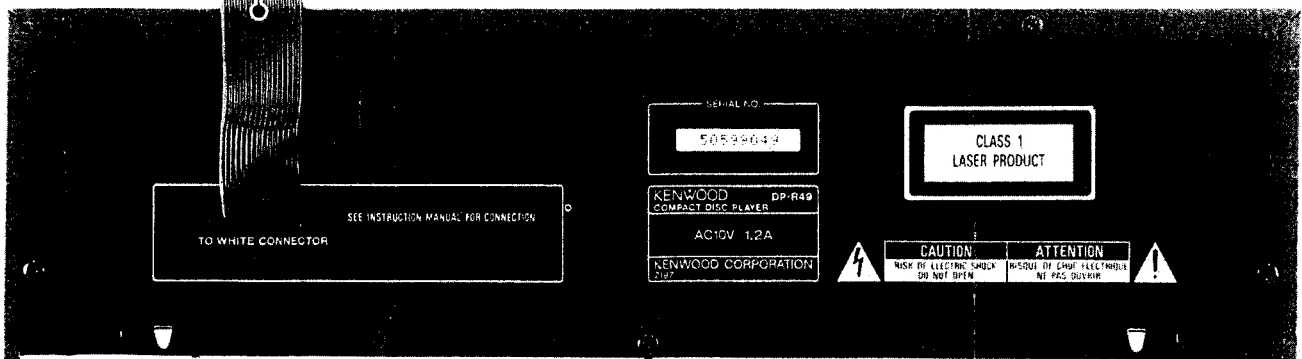
Front glass  
(B10-2123-02)



Panel  
(A29-0802-02)

Foot(Front)  
(J02-1122-05)

Cord with connector(15P)  
(E30-2723-05)



In compliance with Federal Regulations, following are reproductions of labels on, or inside the product relating to laser product safety.

KENWOOD-Corp. certifies this equipment conforms to DHHS Regulations No. 21 CFR 1040. 10, Chapter 1, Subchapter J.

**DANGER : Laser radiation when open and interlock defeated.  
AVOID DIRECT EXPOSURE TO BEAM.**

Foot(Rear)  
J02-0370-05

### PRECAUTIONS FOR REPAIR

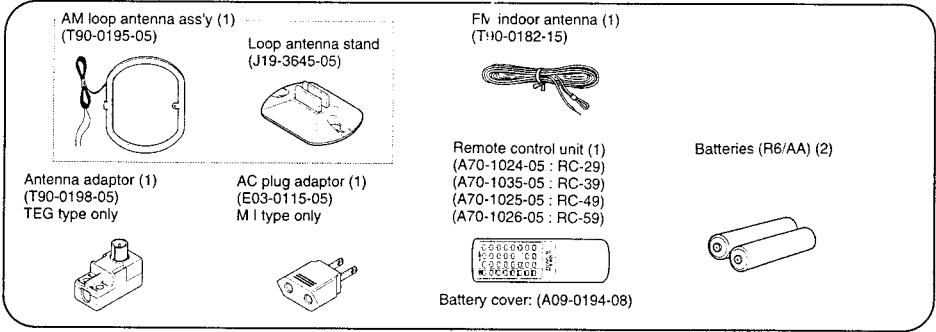
DP-R49 does not have a power supply transformer. Use RX-49, RX-59 or PS-94UA power supply to supply power.

CONTENTS / ACCESSORIES

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For BTL Driver BA6198FP(X32-IC3), refer to the Service Manual of DP-J695/J1070/J2070.

Accessories (All accessories are packed with the Receiver unit.)



System configuration

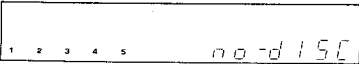
| System | Receiver | CD Player | Speaker     | System  | Receiver | CD Player | Speaker |
|--------|----------|-----------|-------------|---------|----------|-----------|---------|
| M-49M  | RX-49    | DP-R49    | LS-29/49/59 | M-686M  | RX-59    | DP-R49    | LS-59   |
| M-49   | RX-49    | DP-29     | LS-29/49    | M-686LD | RX-59    | LVD-59    | LS-59   |
| M-29M  | RX-49    | DP-R49    | LS-29/29M   | M-383LD | RX-39    | LVD-59    | LS-39   |
| M-29   | RX-29    | DP-29     | LS-29/29M   |         |          |           |         |

| Instruction manual (M-49 / M-49M / M-29 / M-29M) |             |       | Instruction manual (M-686M / M-686LD) |             |    |
|--|-------------|-------|---------------------------------------|-------------|----|
| ENGLISH  | B60-2238-00 | YMIXT | ENGLISH                               | B60-2246-00 | MI |
| FRENCH   | B60-2239-00 | E     | CHINESE                               | B60-2248-00 | MI |
| GERMAN   | B60-2240-00 | EG    | TAIWANESE                             | B60-2249-00 | M  |
| DUTCH  | B60-2241-00 | E     |                                       |             |    |
| ITALIAN  | B60-2242-00 | E     |                                       |             |    |
| SPANISH  | B60-2243-00 | ME    |                                       |             |    |
| CHINESE  | B60-2244-00 | MI    |                                       |             |    |
| TAIWANESE  | B60-2245-00 | M     |                                       |             |    |
| PORTUGUESE                                       | B60-2343-00 | ME    |                                       |             |    |

| Instruction manual (M-383LD) |             |    |
|------------------------------|-------------|----|
| ENGLISH                      | B60-2329-00 | MI |
| CHINESE                      | B60-2331-00 | MI |
| TAIWANESE                    | B60-2332-00 | M  |

Caution

**Note related to transportation and movement**  
Before transporting or moving this unit, carry out the following operations.  
1. Turn the power ON but do not load a disc.  
2. Wait a few seconds and verify that the display shown appears.  
3. Turn the power OFF.

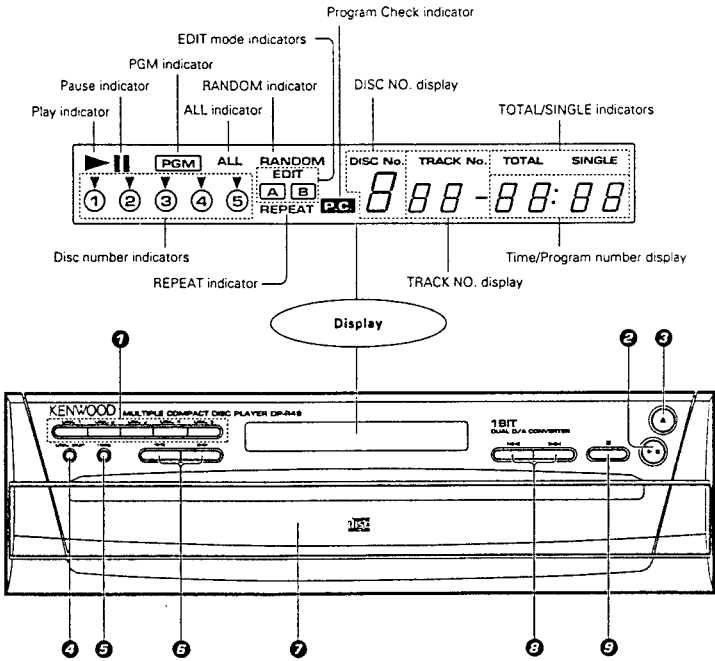


**Beware of condensation**  
When water vapor comes into contact with the surface of cold material, water drops are produced. If condensation occurs, correct operation may not be possible, or the unit may not function correctly. This is not a malfunction, however, and the unit should be dried. (To do this, turn the POWER switch ON and leave the unit for several hours.)

**Be especially careful in the following conditions:**

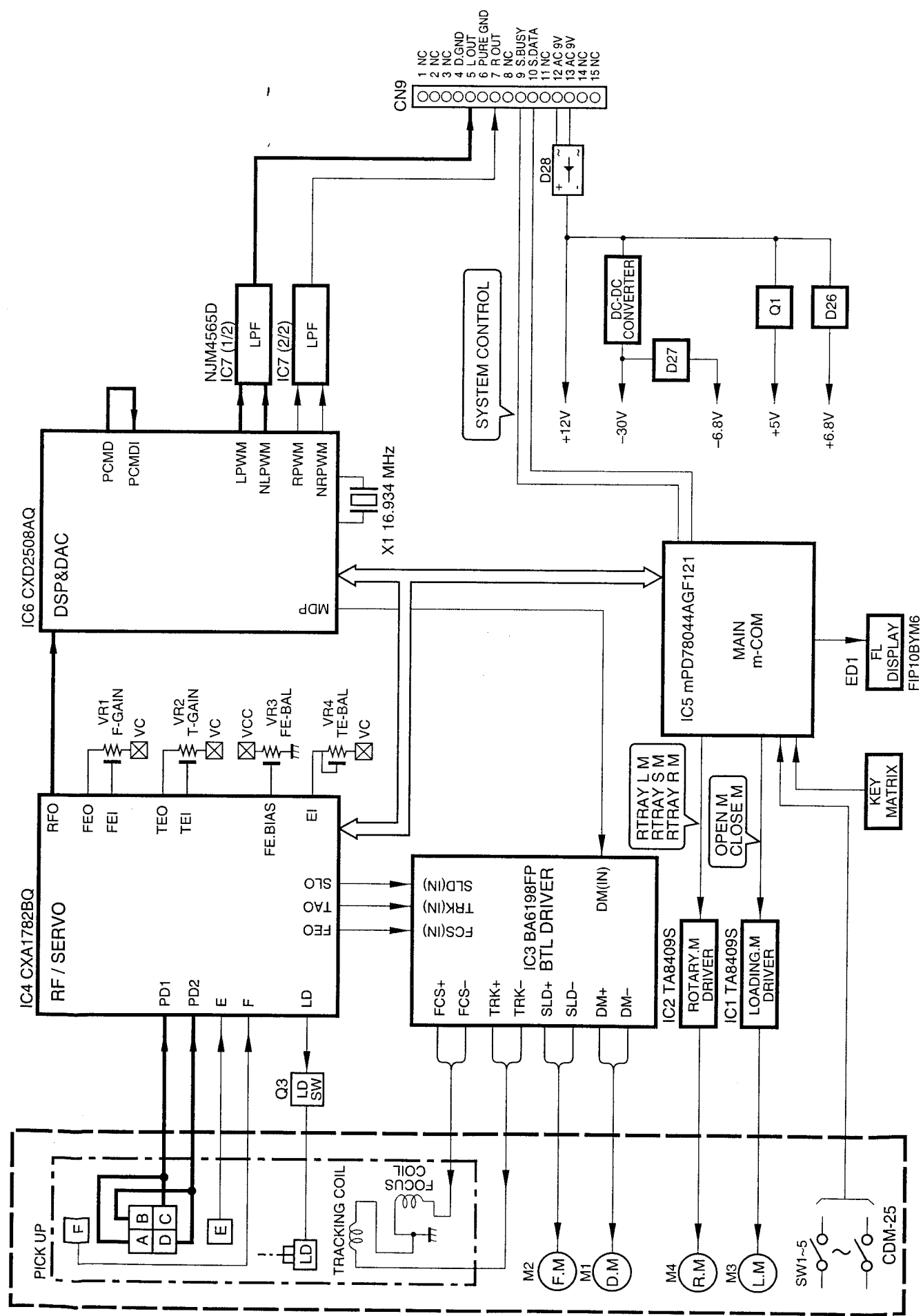
- When the unit is brought from a cold place to a warm place, and there is a large temperature difference.
- When a heater starts operating.
- When the unit is brought from an air-conditioned place to a place of high temperature with high humidity.
- When there is a large difference between the internal temperature of the unit and the ambient temperature, or in conditions where condensation occurs easily.

CONTROLS



- ① Disc selector keys (DISC 1-DISC 5)
- ② Play/pause key
- ③ Open/Close key
- ④ DISC SKIP key
- ⑤ TIME key
- ⑥ Search keys
- ⑦ Disc tray
- ⑧ Skip keys
- ⑨ Press to skip to the beginning of another track.
- ⑩ Stop key

## BLOCK DIAGRAM



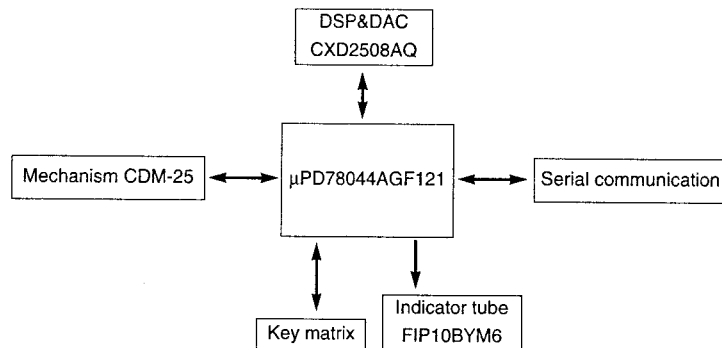
## CIRCUIT DESCRIPTION

- As the tray removed, the clasper can be moved by hand.

## 2-1 Block diagram

| Step | Key name | Description                      | Display |
|------|----------|----------------------------------|---------|
| 1    | PLAY     | 03 mode↔05 mode                  | 03↔05   |
| 2    | UP       | Display goes on                  |         |
| 3    | DOWN     | Display goes off                 |         |
| 4    | DISC 1   | Search the position of Disc No.1 |         |
| 5    | STOP     | Stop                             | 00      |
| 6    | DISC 2   | Release the Test mode            |         |

|                | 03 mode | 05 mode |
|----------------|---------|---------|
| Focus servo    | ON      | ON      |
| Tracking servo | OFF     | ON      |
| Feed servo     | OFF     | ON      |

[illegible]

|     | SCAN0     | SCAN1  | SCAN4 | SCAN7      |
|-----|-----------|--------|-------|------------|
| KR0 | FB        | DISC 5 | STOP  | PLAY/PAUSE |
| KR1 | DISPLAY   | DISC 4 | UP    | OPEN/CLOSE |
| KR2 | DISC SKIP | DISC 3 | DOWN  | -          |
| KR3 | DISC 1    | DISC 2 | FF    | -          |



## CIRCUIT DESCRIPTION

## 2-3 Pin description

| No. | Name             | I/O | Description                       | No. | Name            | I/O | Description                            |
|-----|------------------|-----|-----------------------------------|-----|-----------------|-----|--|
| 1   | T6/G4            | O   | FL grid 4                         | 41  | LDC             | O   | Laser signal output                    |
| 2   | T5/G5            | O   | FL grid 5                         | 42  | SBUSY           | I/O | System serial BUSY signal input/output |
| 3   | T4/G6            | O   | FL grid 6                         | 43  | SDATA           | I/O | System serial DATA signal input/output |
| 4   | T3/G7            | O   | FL grid 7                         | 44  | SCOR            | I   | Sub-cord synchro detection signal      |
| 5   | T2/G8            | O   | FL grid 8                         | 45  | PSENSE          | I   | Position detection (CDM-25)            |
| 6   | T1/G9            | O   | FL grid 9                         | 46  | DSENSE          | I   | Disc detection (CDM-25)                |
| 7   | T0/G10           | O   | FL grid 10                        | 47  | N.C             | I   | Not used (+5V)                         |
| 8   | V <sub>DD</sub>  | -   | Power supply (+5V)                | 48  | GND             | -   | Not used (GND)                         |
| 9   | SQCK             | O   | Q-data read clock output          | 49  | LAT             | O   | Latch output to CXD2500                |
| 10  | N.C              | I   | Not used (Pull down GND)          | 50  | DTA             | O   | Data output to CXD2500                 |
| 11  | SUBQ             | I   | Q-data input                      | 51  | CLK             | O   | Clock output to CXD2500                |
| 12  | N.C              | I   | Not used (Pull down GND)          | 52  | V <sub>DD</sub> | -   | Power supply (+5V)                     |
| 13  | N.C              | I   | Not used (Pull down GND)          | 53  | N.C             | I   | Not used (Pull down GND)               |
| 14  | N.C              | I   | Not used (Pull down GND)          | 54  | N.C             | I   | Not used (Pull down GND)               |
| 15  | N.C              | I   | Not used (Pull down GND)          | 55  | RTRAY R         | O   | Rotary tray motor control (CW)         |
| 16  | N.C              | I   | Not used (Pull down GND)          | 56  | RTRAY S         | O   | Rotary tray motor control (Speed down) |
| 17  | RESET            | I   | μ-com reset                       | 57  | RTRAY L         | O   | Rotary tray motor control (CCW)        |
| 18  | SLT SW           | I   | Start limit switch input (CDM-25) | 58  | CLOSE M         | O   | Close motor control                    |
| 19  | OPEN SW          | I   | Open switch input (CDM-25)        | 59  | OPEN M          | O   | Open motor control                     |
| 20  | AV <sub>SS</sub> | -   | Not used (GND)                    | 60  | MON             | O   | Focus lock countermeasure              |
| 21  | CLOSE SW         | I   | Close switch input (CDM-25)       | 61  | N.C             | O   | Not used (OPEN)                        |
| 22  | UP SW            | I   | Up switch input (CDM-25)          | 62  | N.C             | O   | Not used (OPEN)                        |
| 23  | DOWN SW          | I   | Down switch input (CDM-25)        | 63  | N.C             | O   | Not used (OPEN)                        |
| 24  | SENSE            | I   | SENSE input from CXD2517          | 64  | N.C             | O   | Not used (OPEN)                        |
| 25  | KR0              | I   | Key return 0                      | 65  | N.C             | O   | Not used (OPEN)                        |
| 26  | KR1              | I   | Key return 1                      | 66  | N.C             | O   | Not used (OPEN)                        |
| 27  | KR2              | I   | Key return 2                      | 67  | S9 j            | O   | FL segment j                           |
| 28  | KR3              | I   | Key return 3                      | 68  | S8 i            | O   | FL segment i                           |
| 29  | AV <sub>DD</sub> | -   | Not used (+5V)                    | 69  | S7 h/KS7        | O   | FL segment h/Key scan 7                |
| 30  | AVREF            | -   | Not used (GND)                    | 70  | S6 d            | O   | FL segment d                           |
| 31  | FOK              | I   | FOK signal input                  | 71  | VLOAD           | -   | -30V power supply for FL driver        |
| 32  | XT2              | -   | Not used (OPEN)                   | 72  | S5 e            | O   | FL segment e                           |
| 33  | V <sub>SS</sub>  | -   | GND                               | 73  | S4 c/KS4        | O   | FL segment c                           |
| 34  | X1               | I   | System clock input                | 74  | S3 g            | O   | FL segment g                           |
| 35  | X2               | -   | Not used (OPEN)                   | 75  | S2 f            | O   | FL segment f                           |
| 36  | GFS              | I   | Frame signal input                | 76  | S1 b/KS1        | O   | FL segment b/Key scan 1                |
| 37  | N.C              | O   | Not used (OPEN)                   | 77  | S0 a/KS0        | O   | FL segment a/Key scan 0                |
| 38  | N.C              | O   | Not used (OPEN)                   | 78  | T9/G1           | O   | FL grid 1                              |
| 39  | N.C              | I   | Not used (Pull down GND)          | 79  | T8/G2           | O   | FL grid 2                              |
| 40  | N.C              | I   | Not used (Pull down GND)          | 80  | T7/G3           | O   | FL grid 3                              |

## CIRCUIT DESCRIPTION

## 3. DSP&amp;DAC : CXD2508AQ (X32- A/2, IC6)

## 3-1 Pin description

| No.    | Name              | I/O | Description   |
|--------|-------------------|-----|---|
| 1      | SCOR              | O   | Outputs high signal when either sub code sync S0 or S1 is detected  |
| 2      | SBSO              | O   | Sub P to W serial output  |
| 3      | EXCK              | I   | SBSO read-out clock input   |
| 4      | SQSO              | O   | Sub Q 80-bit serial output  |
| 5      | SQCK              | I   | SQSO read-out clock input   |
| 6      | MUTE              | I   | High : mute; Low : release (DAC)  |
| 7      | SENS              | O   | SENS output to CPU  |
| 8      | XRST              | I   | System reset; Reset when low  |
| 9      | DATA              | I   | Serial data input from CPU  |
| 10     | XLAT              | I   | Latch input from CPU; Serial data is latched at the falling edge  |
| 11     | CLOCK             | I   | Serial data transfer clock input from CPU   |
| 12     | V <sub>SS</sub>   |     | GND   |
| 13     | SEIN              | I   | Sense input from SSP  |
| 14     | CNIN              | I   | Track jump count signal input   |
| 15     | DATO              | O   | Serial data output to SSP   |
| 16     | XLTO              | O   | Serial data latch output to SSP; Latched at the falling edge  |
| 17     | CLKO              | O   | Serial data transfer clock output to SSP  |
| 18-20  | SPOA,SPOB,SPOC    | I   | u-com extended interface (input A-C)  |
| 21     | XTSL              | I   | Crystal selection input; Set low when the crystal is 16.9344MHz, high when 33.8688MHz   |
| 22     | XLON              | O   | u-com extended interface (output)   |
| 23     | FOK               | I   | Focus OK input; Used for SENS output and the servo auto sequencer   |
| 24     | MON               | O   | Spindle motor ON/OFF control output   |
| 25, 26 | MDP, MDS          | O   | Spindle motor servo control   |
| 27     | LOCK              | O   | GFS is sampled at 460Hz; when GFS is high, this pin outputs a high signal. If GFS is low eight consecutive samples, this pin outputs low. |
| 28     | TEST              | I   | Test pin (normally GND)   |
| 29     | FILO              | O   | Master PLL (slave=digital PLL) filter output  |
| 30     | FILI              | I   | Master PLL filter input   |
| 31     | PCO               | O   | Master PLL charge pump output   |
| 32     | V <sub>DD</sub>   |     | Digital power supply for DSP  |
| 33     | AV <sub>SS1</sub> |     | GND (analog) for DSP  |
| 34     | CLTV              | I   | Master VCO control voltage input  |
| 35     | AV <sub>DD1</sub> |     | Analog power supply for DSP   |
| 36     | RF                | I   | EFM signal input  |
| 37     | BIAS              | I   | Constant current input of asymmetry circuit   |
| 38     | ASYI              | I   | Asymmetry comparator voltage input  |
| 39     | ASYO              | O   | EFM full-swing output (low=V <sub>SS</sub> , high=V <sub>DD</sub> )   |
| 40     | ASYE              | I   | Low : asymmetry circuit off; High : asymmetry circuit on  |
| 41     | WDCK              | O   | D/A interface for 48-bit; Word clock f=2Fs  |
| 42     | LRCK              | O   | D/A interface for 48-bit; LR clock f=Fs   |

CIRCUIT DESCRIPTION

| No.    | Name              | I/O | Description  |
|--------|-------------------|-----|--|
| 43     | LRCKI             | I   | LR clock input to DAC  |
| 44     | PCMD              | O   | D/A interface; Serial data (two's complement, MSB first)                             |
| 45     | PCMDI             | I   | Audio data input to DAC (48-bit)   |
| 46     | BCK               | O   | D/A interface; Bit clock   |
| 47     | BCKI              | I   | Bit clock input to DAC (48-bit)  |
| 48     | GTOP              | O   | GTOP output  |
| 49     | XUGF              | O   | XUGF output  |
| 50     | XPCK              | O   | XPLCK output   |
| 51     | GFS               | O   | GFS output   |
| 52     | RFCK              | O   | RFCK output  |
| 53     | V <sub>ss</sub>   |     | GND  |
| 54     | C2PO              | O   | C2PO output  |
| 55     | XROF              | O   | XRAOF output   |
| 56-58  | MNT3,MNT1,MNT0    | O   | MNT3, MNT1, MNT0 output  |
| 59     | FSTT              | O   | 2/3 frequency divider output for pins 73 and 74                                      |
| 60     | C4M               | O   | 4.2336 MHz output  |
| 61     | DOUT              | O   | Digital-out output   |
| 62     | DMPH              | O   | Outputs high signal when the playback disc has emphasis, low signal when no emphasis |
| 63     | EMPHI             | I   | DAC de-emphasis ON/OFF; High=ON, Low=OFF   |
| 64     | WFCK              | O   | WFCK (Write Frame Clock) output  |
| 65     | ZEROL             | O   | No-sound data detection; High=detected (L ch)  |
| 66     | ZEROR             | O   | No-sound data detection; High=detected (R ch)  |
| 67     | DTS1              | I   | Test pin 1 for DAC (normally Low)  |
| 68     | V <sub>so</sub>   |     | Digital power supply for DAC   |
| 69     | NLPWM             | O   | L ch PWM output  |
| 70     | LPWM              | O   | L ch PWM output  |
| 71     | AV <sub>cc2</sub> |     | Power supply for PWM driver  |
| 72     | AV <sub>cc3</sub> |     | Power supply for crystal   |
| 73     | XTAI              | I   | 33.8688MHz crystal oscillation circuit input   |
| 74     | XTAO              | O   | 33.8688MHz crystal oscillation circuit output  |
| 75     | AV <sub>ss3</sub> |     | GND for crystal  |
| 76     | AV <sub>ss2</sub> |     | GND for PWM driver   |
| 77     | NRPWM             | O   | R ch PWM output  |
| 78     | RPWM              | O   | R ch PWM output  |
| 79, 80 | DTS2,DTS3         | I   | Test pin 2, 3 for DAC (normally Low)   |

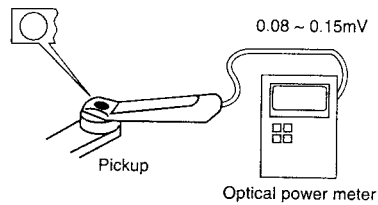
- Notes:
- PCMD is two's complement output of MSB first.
  - GTOP is used to monitor the frame sync protection status. (H:Sync protection window free)
  - XUGF is the negative pulse for the frame sync derived from the EFM signal. It is the signal before sync protection.
  - XPLCK is the inverse of EFM PLL clock. The PLL is designed so that the falling edge and the EFM signal transition point coincide.
  - GFS goes high when the frame sync and the insertion protection timing match.
  - RFCK is derived from the crystal accuracy. This signal has cycle of 136μ.
  - C2PO represents the data error status.
  - XRAOF is generated when the 16K RAM exceeds the ±4F jitter margin.

## ADJUSTMENT

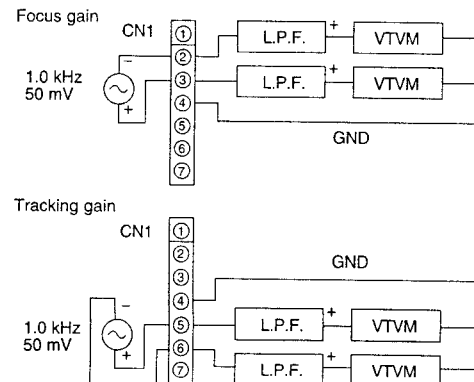
| No.  | ITEM           | INPUT SETTING  | OUTPUT SETTING  | PLAYER SETTING  | ALIGNMENT POINT   | ALIGN FOR  | FIG.       |
|--|----------------|--|---|---|-------------------|--|------------|
| Remove the clamper ass'y before step 1. And remount it after step 1. |                |  |   |   |                   |  |            |
| 1  | LASER POWER    | -  | Set the sensor section of the optical power meter on the pickup lens.           | With pressing the TIME key, turn the power on to enter the test mode. Press the PLAY key to check that the display is "03".                             | -                 | On the power from 0.08 to 0.15 mW, when the diffraction grating is correctly aligned with the RF level of 1.0Vp-p or more. | (a)        |
| Clamp the disc beforehand.   |                |  |   |   |                   |  |            |
| 2  | FOCUS ERROR    | Test disc Type 4   | Connect an oscilloscope as follows.<br>CH1:RF (CN1-1)<br>CH2:FE (CN1-2)         | With pressing the TIME key, turn the power on. Press the PLAY key. Confirm the display is "05". (Each press of the PLAY key changes the display 03↔05.) | TE BALANCE VR3    | Optimum eye pattern  | (b) or (d) |
| 3  | TRACKING ERROR | Test disc Type 4   | Connect an oscilloscope as follows.<br>CH1:RF (CN1-1)<br>CH2:TE (CN1-6)         | Press the PLAY key. Confirm the display is "03". (Each press of the PLAY key changes the display 03↔05.)  | TE BALANCE VR4    | Symmetry between upper and lower   | (c)        |
| 4  | FOCUS GAIN     | Test disc Type 4<br>Apply signal of 1.0 kHz, 50mVrms to CN1 pin 2-3. | Connect a LPF to CN1 pin 2-3 to which connect an oscilloscope or AC voltmeters. | Press the PLAY key. Confirm the display is "05". (Each press of the PLAY key changes the display 03↔05.)  | FOCUS GAIN VR1    | Two VTVMs should read the same value.  | (e)        |
| 5  | TRACKING GAIN  | Test disc Type 4<br>Apply signal of 1.0 kHz, 50mVrms to CN1 pin 5-6. | Connect a LPF to CN1 pin 5-6 to which connect an oscilloscope or AC voltmeters. | Press the PLAY key. Confirm the display is "05". (Each press of the PLAY key changes the display 03↔05.)  | TRACKING GAIN VR2 | Two VTVMs should read the same value.  | (e)        |

Note:  
Type 4disc :SONY YEDS-18 Test Disc or equivalent.  
LPF : Around 47kΩ + 390 pF or so.  
Step 1 ~ 5 are in Test Mode.

### (a) Laser power

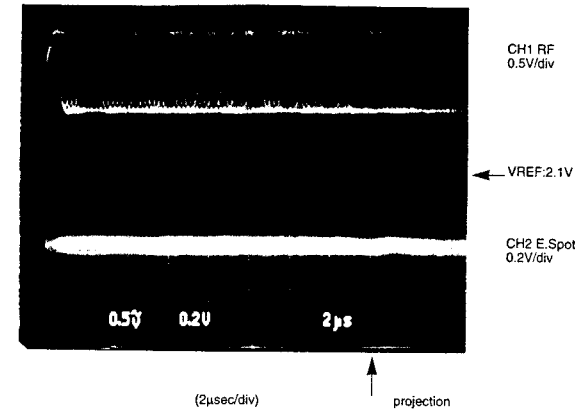


### (e) Focus Gain, Tracking Gain



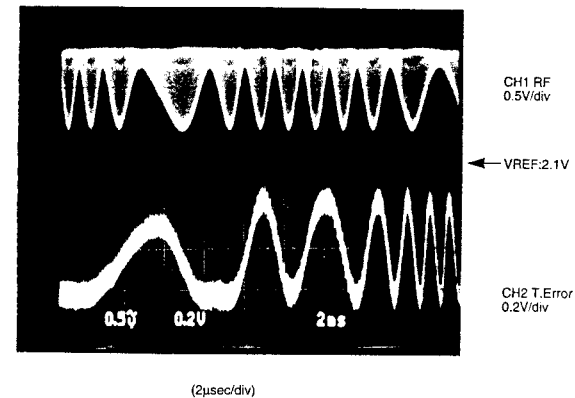
## ADJUSTMENT

FIG.(b)



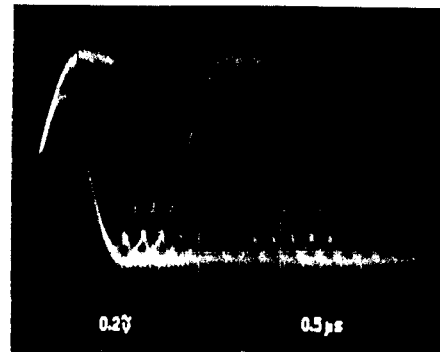
- RF signal and E.Spot signal in test mode (PLAY).
- If the diffraction grating has been adjusted properly, the influence of triggering is observed on the E.Spot waveform of approx. 18us after RF signal, in the form of a projection.

FIG.(c)



- RF signal and T.Error signal in test mode (Focusing ON). (Disc Type 4).
- Adjust T.Error so that the waveform is symmetrical above and below VREF(VR4).

FIG.(d)



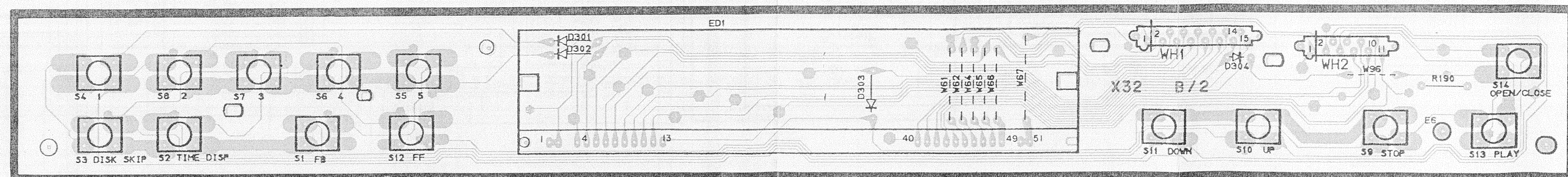
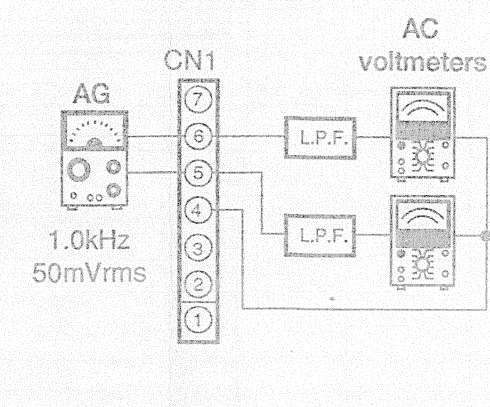
- RF signal in test mode (PLAY).
- Perform the tangential and focusing offset adjustments so that each of the center cross points are focused into one point on the display. The crossing points above and below the center shall also be displayed clearly.

RF signal  
0.2V/div

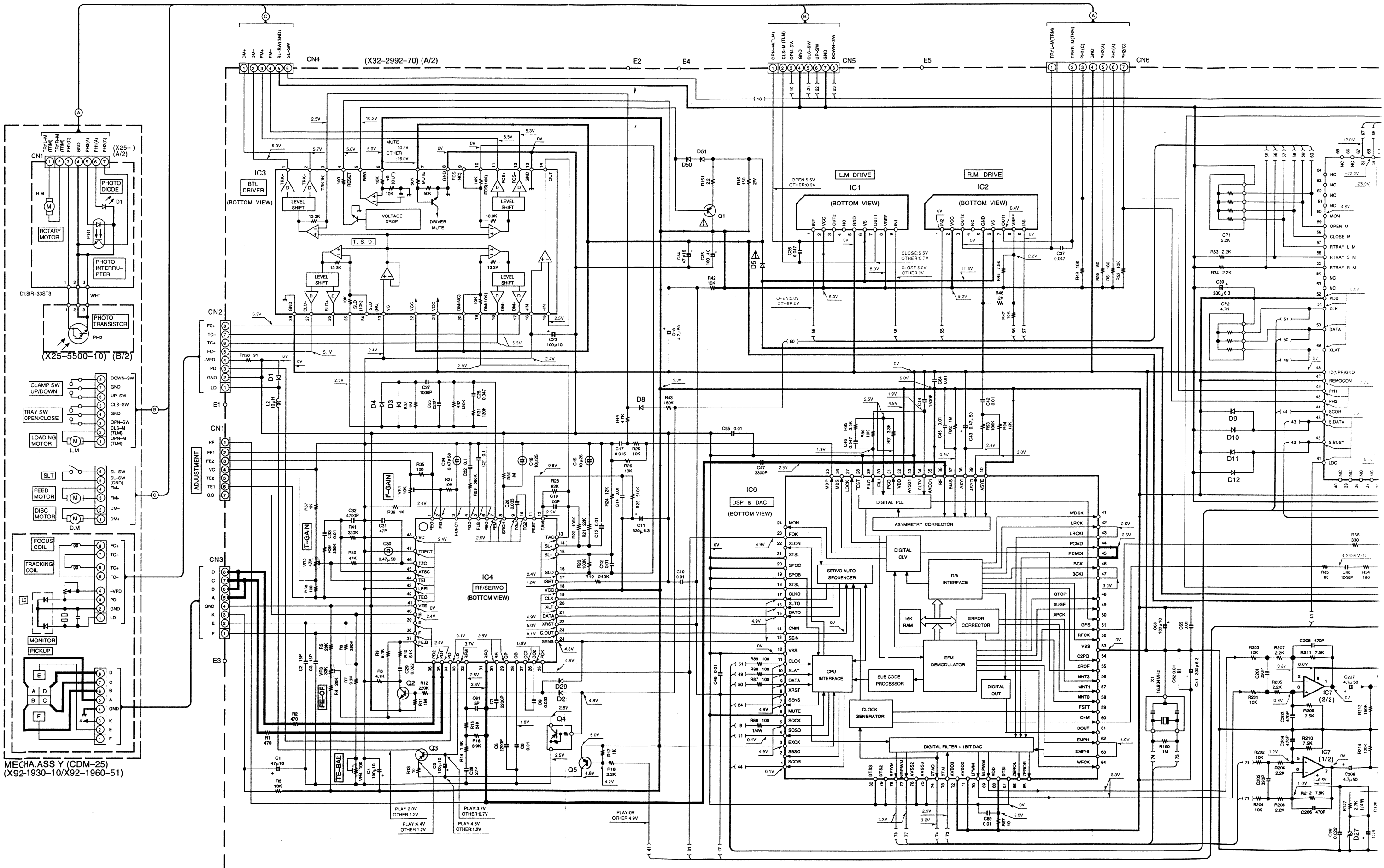


A B C D E F G H I J

Tracking gain :  
Two VTVMs should read the same value.



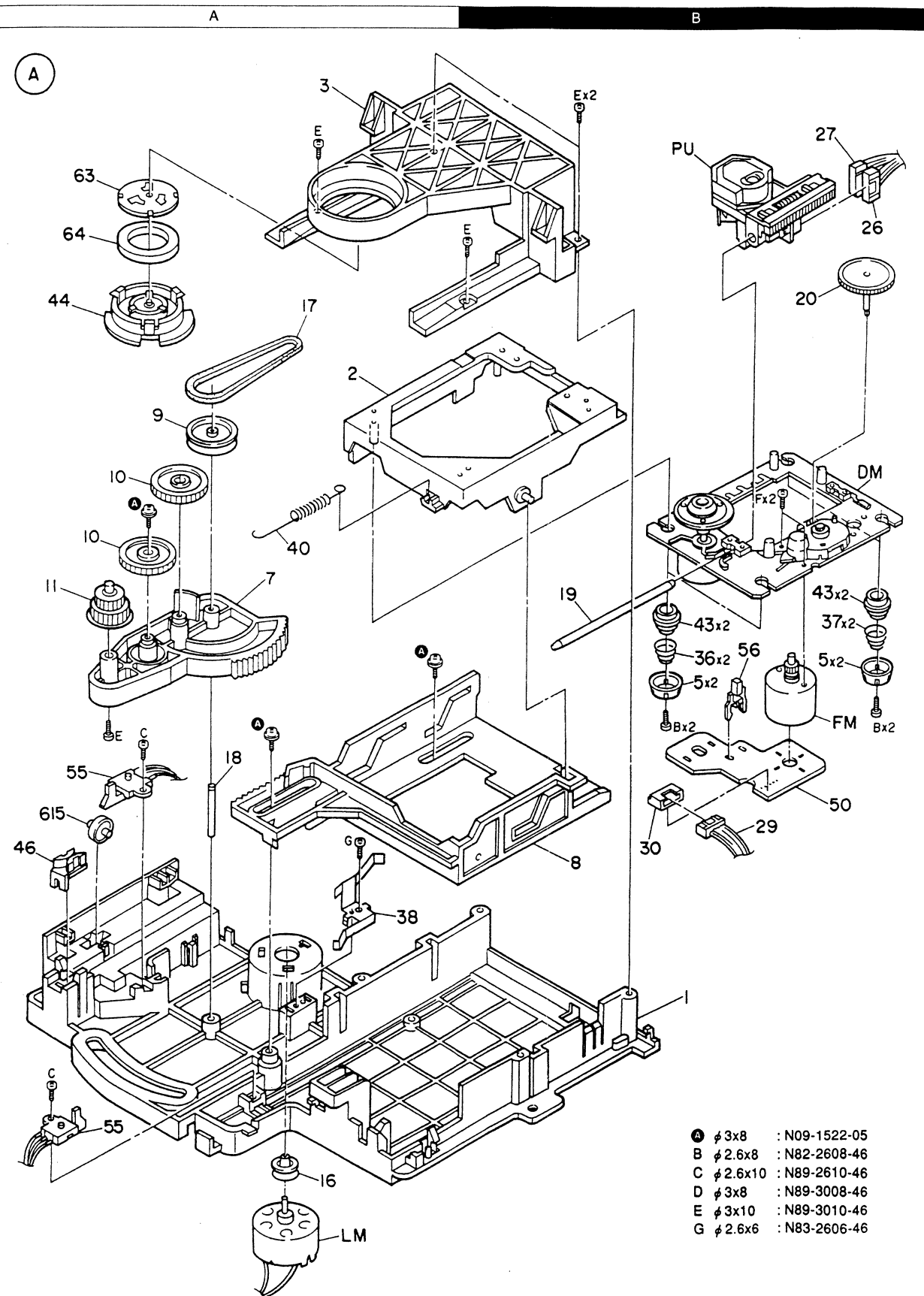






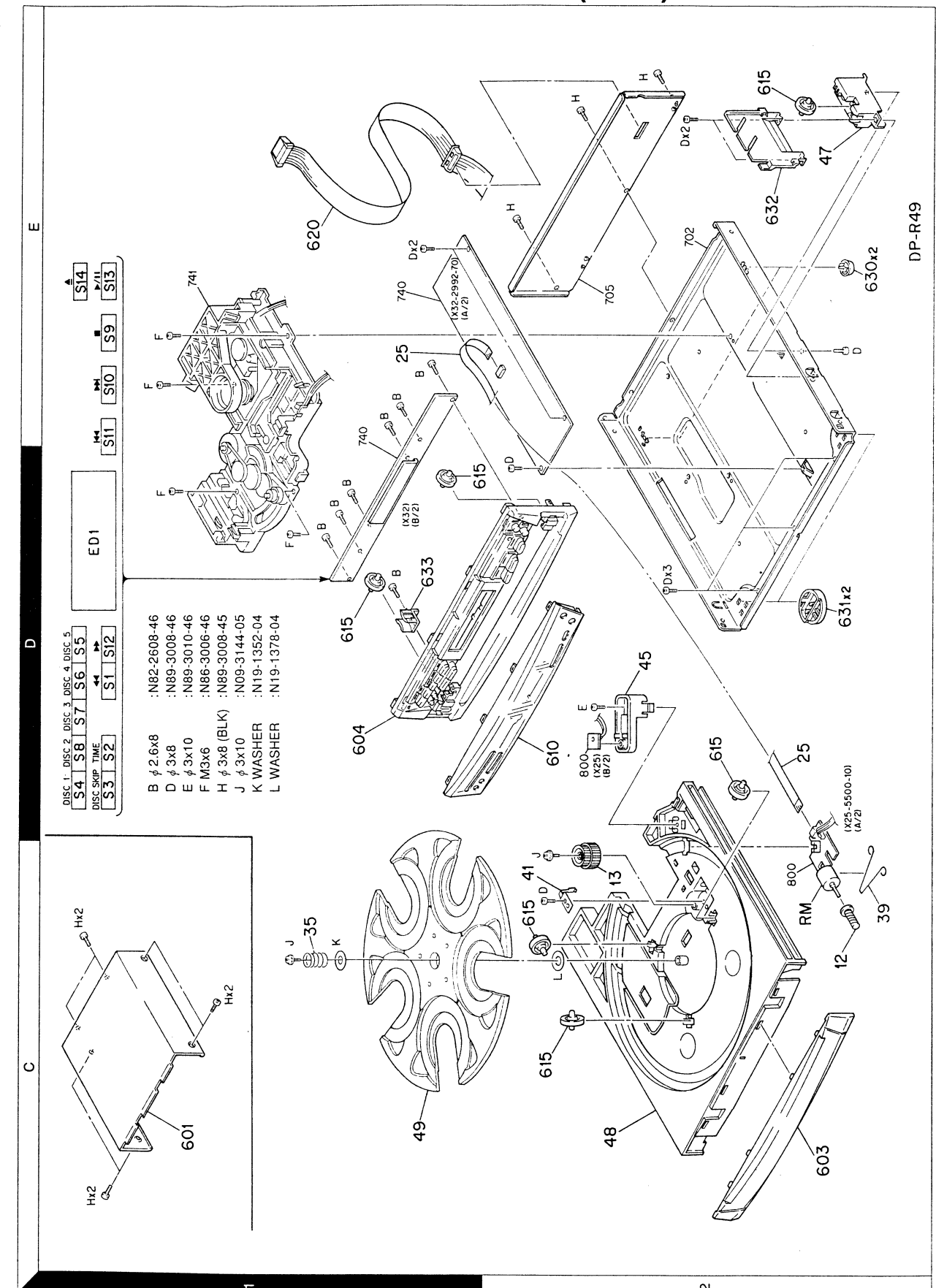
# DP-R49

## EXPLODED VIEW(MECHANISM)



# DP-R49

## EXPLODED VIEW(UNIT)



19 \* New Parts  
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NO.1

| Ref. No.                    | Add-ress | New Parts | Parts No.     | Description                    | Desti-nation | Re-marks |
|-----------------------------|----------|-----------|---------------|--------------------------------|--------------|----------|
| DP-R49                      |          |           |               |                                |              |          |
| 601                         | 1C       | *         | A01-3252-01   | METALLIC CABINET               |              |          |
| 603                         | 2C       | *         | A29-0802-02   | PANEL                          |              |          |
| 604                         | 1D       | *         | A60-0755-01   | PANEL                          |              |          |
| 610                         | 2D       | *         | B10-2123-02   | FRONT GLASS                    |              |          |
| 615                         | 1D,2D    |           | D14-0357-04   | ROLLER                         |              |          |
| 620                         | 1E       |           | E30-2723-05   | CORD WITH CONNECTOR(15P) WHITE |              |          |
|                             |          | *         | H50-1541-04   | ITEM CARTON CASE               | EGYXT        |          |
|                             |          | *         | H50-1542-04   | ITEM CARTON CASE               | MI           |          |
|                             |          | *         | H10-7064-12   | POLYSTYRENE FOAMED FIXTURE (L) |              |          |
|                             |          | *         | H10-7065-12   | POLYSTYRENE FOAMED FIXTURE (R) | MI           |          |
|                             |          |           | H20-0568-04   | PROTECTION COVER               |              |          |
|                             |          |           | H21-0303-04   | PROTECTION SHEET               | EGYXT        |          |
|                             |          |           | H25-1516-04   | PROTECTION BAG                 |              |          |
| 630                         | 2E       |           | J02-0370-05   | FOOT (REAR)                    |              |          |
| 631                         | 2D       |           | J02-1122-05   | FOOT (FRONT)                   |              |          |
| 632                         | 2E       | *         | J19-5606-03   | HOLDER                         |              |          |
| 633                         | 1D       |           | J90-0811-04   | GUIDE                          |              |          |
| MECHANISM PCB (X25-5500-10) |          |           |               |                                |              |          |
| CN1                         | 2D       |           | E40-4187-05   | FLAT CABLE CONNECTOR (7P)      |              |          |
| PH1                         |          | *         | T95-0132-05   | OPTO ISOLATOR                  |              |          |
| D1                          |          |           | SIR-33ST3     | INFRARED LED                   |              |          |
| PH2                         |          | *         | RPT-38PT3F    | PHOTO TRANSISTOR               |              |          |
| CD PLAYER UNIT(X32-2992-70) |          |           |               |                                |              |          |
| C1                          |          |           | CE04LW1A470M  | ELECTRO                        | 47UF         | 10WV     |
| C2,3                        |          |           | CC45FSL1H150J | CERAMIC                        | 15PF         | J        |
| C4,5                        |          |           | CE04LW1A101M  | ELECTRO                        | 100UF        | 10WV     |
| C6,7                        |          |           | CK45FB1H222K  | CERAMIC                        | 2200PF       | K        |
| C8                          |          |           | CQ93FMG1H103J | MYLAR                          | 0.010UF      | J        |
| C9                          |          |           | CQ93FMG1H333J | MYLAR                          | 0.033UF      | J        |
| C10                         |          |           | CK45FF1H103Z  | CERAMIC                        | 0.010UF      | Z        |
| C11                         |          |           | CE04LW0J331M  | ELECTRO                        | 330UF        | 6.3WV    |
| C12                         |          |           | CK45FF1H103Z  | CERAMIC                        | 0.010UF      | Z        |
| C13,14                      |          |           | CQ93FMG1H103J | MYLAR                          | 0.010UF      | J        |
| C15,16                      |          |           | CE04HW1E100M  | NP-ELEC                        | 10UF         | 25WV     |
| C17                         |          |           | CQ93FMG1H153J | MYLAR                          | 0.015UF      | J        |
| C18                         |          |           | CE04LW1H4R7M  | ELECTRO                        | 4.7UF        | 50WV     |
| C19                         |          |           | CC45FSL1H101J | CERAMIC                        | 100PF        | J        |
| C20                         |          |           | CQ93FMG1H333J | MYLAR                          | 0.033UF      | J        |
| C21,22                      |          |           | CQ93FMG1H104J | MYLAR                          | 0.10UF       | J        |
| C23                         |          |           | CE04LW1A101M  | ELECTRO                        | 100UF        | 10WV     |
| C24                         |          |           | CE04HW1HR47M  | NP-ELEC                        | 0.47UF       | 50WV     |
| C25                         |          |           | CQ93FMG1H473J | MYLAR                          | 0.047UF      | J        |
| C26                         |          |           | CC45FSL1H221J | CERAMIC                        | 220PF        | J        |
| C27                         |          |           | CK45FB1H102K  | CERAMIC                        | 1000PF       | K        |
| C28                         |          |           | CC45FSL1H270J | CERAMIC                        | 27PF         | J        |

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NO.2

| Ref. No. | Add-ress | New Parts | Parts No.     | Description                  | Desti-nation | Re-marks |
|----------|----------|-----------|---------------|------------------------------|--------------|----------|
| C29      |          |           | CQ93FMG1H223J | MYLAR                        | 0.022UF      | J        |
| C30      |          |           | CE04HW1HR47M  | NP-ELEC                      | 0.47UF       | 50WV     |
| C31      |          |           | CC45FSL1H470J | CERAMIC                      | 47PF         | J        |
| C32      |          |           | CQ93FMG1H472J | MYLAR                        | 4700PF       | J        |
| C33      |          |           | CQ93FMG1H103J | MYLAR                        | 0.010UF      | J        |
| C34      |          |           | CE04LW1C470M  | ELECTRO                      | 47UF         | 16WV     |
| C35      |          |           | CE04LW1A101M  | ELECTRO                      | 100UF        | 10WV     |
| C36,37   |          |           | CQ93FMG1H473J | MYLAR                        | 0.047UF      | J        |
| C38      |          |           | CK45FF1H103Z  | CERAMIC                      | 0.010UF      | Z        |
| C39      |          |           | CE04LW0J331M  | ELECTRO                      | 330UF        | 6.3WV    |
| C40      |          |           | CK45FB1H102K  | CERAMIC                      | 1000PF       | K        |
| C41      |          |           | CE04LW0J331M  | ELECTRO                      | 330UF        | 6.3WV    |
| C42      |          |           | CQ93FMG1H103J | MYLAR                        | 0.010UF      | J        |
| C43      |          |           | CE04LW1HR47M  | ELECTRO                      | 0.47UF       | 50WV     |
| C44      |          |           | CK45FB1H152K  | CERAMIC                      | 1500PF       | K        |
| C45      |          |           | CK45FF1H103Z  | CERAMIC                      | 0.010UF      | Z        |
| C46      |          |           | CQ93FMG1H473J | MYLAR                        | 0.047UF      | J        |
| C47      |          |           | CQ93FMG1H332J | MYLAR                        | 3300PF       | J        |
| C48      |          |           | CK45FF1H103Z  | CERAMIC                      | 0.010UF      | Z        |
| C49      |          |           | CE04LW1V470M  | ELECTRO                      | 47UF         | 35WV     |
| C50,51   |          |           | CK45FB1H102K  | CERAMIC                      | 1000PF       | K        |
| C52,53   |          |           | CK45FF1H473Z  | CERAMIC                      | 0.047UF      | Z        |
| C54,55   |          |           | CK45FF1H103Z  | CERAMIC                      | 0.010UF      | Z        |
| C56,57   |          |           | CC45FSL1H221J | CERAMIC                      | 220PF        | J        |
| C58-60   |          |           | CK45FF1H103Z  | CERAMIC                      | 0.010UF      | Z        |
| C61      |          |           | CC45FCH1H050C | CERAMIC                      | 5.0PF        | C        |
| C62      |          |           | CK45FF1H103Z  | CERAMIC                      | 0.010UF      | Z        |
| C63      |          |           | CC45FSL1H150J | CERAMIC                      | 15PF         | J        |
| C64,65   |          |           | CK45FF1H103Z  | CERAMIC                      | 0.010UF      | Z        |
| C66      |          |           | CE04LW1A101M  | ELECTRO                      | 100UF        | 10WV     |
| C67,68   |          |           | CQ93FMG1H223J | MYLAR                        | 0.022UF      | J        |
| C69      |          |           | CK45FF1H103Z  | CERAMIC                      | 0.010UF      | Z        |
| C75,76   |          |           | CE04LW1A101M  | ELECTRO                      | 100UF        | 10WV     |
| C100     |          |           | CK45FB1H152K  | CERAMIC                      | 1500PF       | K        |
| C101     |          |           | CE04LW1C332M  | ELECTRO                      | 3300UF       | 16WV     |
| C201,202 |          |           | CK45FB1H391K  | CERAMIC                      | 390PF        | K        |
| C203-206 |          |           | CK45FB1H471K  | CERAMIC                      | 470PF        | K        |
| C207,208 |          |           | CE04LW1H4R7M  | ELECTRO                      | 4.7UF        | 50WV     |
| C209,210 |          |           | CK45FB1H332K  | CERAMIC                      | 3300PF       | K        |
| CN1      | 1E       |           | E40-4876-05   | PIN ASSY (7P)                |              |          |
| CN2,3    | 1E       |           | E40-3252-05   | PIN ASSY (8P)                |              |          |
| CN4      | 1E       |           | E40-3250-05   | PIN ASSY (6P)                |              |          |
| CN5      | 1E       |           | E40-3252-05   | PIN ASSY (8P)                |              |          |
| CN6      | 1E       |           | E40-4187-05   | FLAT CABLE CONNECTOR (7P)    |              |          |
| CN7      | 1E       |           | E40-4609-05   | PIN ASSY (15P)               |              |          |
| CN8      | 1E       |           | E40-4808-05   | PIN ASSY (11P)               |              |          |
| CN9      | 1E       |           | E40-4609-05   | PIN ASSY (15P)               |              |          |
| E1-5     |          |           | J11-0098-05   | WIRE CLAMPER                 |              |          |
| L1       |          |           | L19-0076-05   | TRANSFORMER FOR CONVERTER    |              |          |
| L2       |          |           | L40-1001-17   | SMALL FIXED INDUCTOR(10UH,K) |              |          |
| X1       |          |           | L78-0299-05   | RESONATOR (16.93MHz)         |              |          |
| CP1      |          |           | R90-0852-05   | MULTI-COMP                   | 2.2KX4       |          |
| CP2      |          |           | R90-0832-05   | MULTI-COMP                   | 4.7KX3 J     | 1/6W     |

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PARTS LIST

DP-R49



PARTS LIST

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NO.4

| Ref. No. | Add. res | New Part | Parts No.   | Description         | Desti- nation | Re- marks |
|----------|----------|----------|-------------|---------------------|---------------|-----------|
| 5        | 2B       |          | B09-0250-04 | CAP                 |               |           |
| 7        | 2A       |          | D10-3439-13 | ARM                 |               |           |
| 8        | 2B       |          | D10-3438-12 | SLIDER              |               |           |
| 9        | 1A       |          | D13-1577-04 | GEAR                |               |           |
| 10       | 2A       |          | D13-1578-04 | GEAR                |               |           |
| 11       | 2A       |          | D13-1579-04 | GEAR                |               |           |
| 12       | 2C       |          | D13-1682-04 | WORM                |               |           |
| 13       | 2C       |          | D13-1581-04 | GEAR                |               |           |
| 16       | 3A       |          | D15-0359-04 | PULLEY              |               |           |
| 17       | 1A       |          | D18-0355-03 | BELT                |               |           |
| 18       | 2A       |          | D21-1763-04 | SHAFT               |               |           |
| 19       | 2B       |          | D10-3492-08 | FEED SHAFT          |               |           |
| 20       | 1B       |          | D13-1643-08 | GEAR (A)            |               |           |
| 25       | 1E,2C    |          | E35-0747-25 | FLAT CABLE (7P)     |               |           |
| 26       | 1B       |          | E35-0748-15 | WIRING HARNESS (8P) |               |           |
| 27       | 1B       |          | E35-0749-15 | WIRING HARNESS (8P) |               |           |
| 29       | 2B       |          | E35-0751-15 | WIRING HARNESS (8P) |               |           |
| 30       | 2B       |          | E40-3284-05 | CONNECTOR (6P)      |               |           |
| 35       | 1C       |          | G01-3630-14 | COMPRESSION SPRING  |               |           |
| 36       | 2B       |          | G01-3753-04 | COMPRESSION SPRING  |               |           |
| 37       | 2B       |          | G01-3754-04 | COMPRESSION SPRING  |               |           |
| 38       | 3A       |          | G02-1049-04 | FLAT SPRING         |               |           |
| 39       | 2C       |          | G09-0634-04 | WIRE SPRING         |               |           |
| 40       | 2A       |          | G01-3697-24 | EXTENSION SPRING    |               |           |
| 41       | 2C       |          | G02-1065-04 | FLAT SPRING         |               |           |
| 43       | 2B       |          | J02-1121-04 | INSULATOR           |               |           |
| 44       | 1A       |          | J11-0198-03 | CLAMPER             |               |           |
| 45       | 2D       |          | J19-3634-04 | HOLDER              |               |           |
| 46       | 2A       |          | J90-0811-04 | GUIDE               |               |           |
| 47       | 2E       |          | J90-0834-02 | GUIDE               |               |           |
| 48       | 2C       | *        | J99-0575-01 | TRAY                |               |           |
| 49       | 1C       | *        | J99-0547-01 | TRAY                |               |           |
| 50       | 2B       |          | J70-0619-08 | MOTOR PCB           |               |           |
| A        | 2A       |          | N09-1522-05 | SET SCREW (3X8)     |               |           |
| J        | 1C,2C    |          | N09-3144-05 | SET SCREW (3X10)    |               |           |
| K        | 1C       |          | N19-1352-04 | FLAT WASHER         |               |           |
| L        | 2C       |          | N19-1378-04 | FLAT WASHER         |               |           |
| 55       | 2A,3A    |          | S33-2061-05 | LEVER SWITCH        |               |           |
| 56       | 2B       |          | S74-0038-08 | LEAF SWITCH         |               |           |
| 63       | 1A       |          | T50-1055-04 | YOKE                |               |           |
| 64       | 1A       |          | T99-0544-15 | MAGNET              |               |           |
| FM       | 2B       |          | T42-0676-08 | MOTOR GEAR (FEED)   |               |           |
| LM       | 3A       |          | T42-0524-05 | DC MOTOR            |               |           |
| PU       | 1B       |          | T25-0011-05 | PICKUP (KSS-210A)   |               |           |
| RM       | 2C       |          | T42-0670-05 | DC MOTOR            |               |           |

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NO.3

| Ref. No.                            | Add. res | New Part | Parts No.      | Description               | Desti- nation | Re- marks |
|-------------------------------------|----------|----------|----------------|---------------------------|---------------|-----------|
| CP3                                 |          |          | R90-0487-05    | MULTI-COMP                | 47KX4         | 1/6W      |
| CP4                                 |          |          | R90-0892-05    | MULTI-COMP                | 4.7KX5        | J         |
| RA5                                 |          |          | RS14KBD151J    | FL-PROOF RS               | 150           | J         |
| VR1                                 |          |          | R12-3685-05    | TRIMMING POT.(10K F-GAIN) |               |           |
| VR2                                 |          |          | R12-3687-05    | TRIMMING POT.(47K T-GAIN) |               |           |
| VR3                                 |          |          | R12-3688-05    | TRIMMING POT.(33K FE-OFF) |               |           |
| VR4                                 |          |          | R12-3685-05    | TRIMMING POT.(10K TE-BAL) |               |           |
| S1-14                               |          |          | S40-1064-05    | PUSH SWITCH               |               |           |
| D1-4                                |          |          | HSS104         | DIODE                     |               |           |
| D1-4                                |          |          | HSS133         | DIODE                     |               |           |
| D5                                  |          |          | S5688B         | DIODE                     |               |           |
| D5                                  |          |          | 1SR139-100     | DIODE                     |               |           |
| D8-12                               |          |          | HSS104         | DIODE                     |               |           |
| D8-12                               |          |          | 1SS133         | DIODE                     |               |           |
| D13                                 |          |          | HZS6.8N(B2)    | ZENER DIODE               |               |           |
| D13                                 |          |          | RD6.8ES(B2)    | ZENER DIODE               |               |           |
| D14                                 |          |          | RD33ES(B)      | ZENER DIODE               |               |           |
| D15 -18                             |          |          | HSS104         | DIODE                     |               |           |
| D15 -18                             |          |          | 1SS133         | DIODE                     |               |           |
| D19                                 |          |          | 1SS92          | DIODE                     |               |           |
| D19                                 |          |          | 1S954          | DIODE                     |               |           |
| D26,27                              |          |          | HZS6.8N(B2)    | ZENER DIODE               |               |           |
| D26,27                              |          |          | RD6.8ES(B2)    | ZENER DIODE               |               |           |
| D28                                 |          |          | KBP02ML-6127   | DIODE                     |               |           |
| D29                                 |          |          | HSS104         | DIODE                     |               |           |
| D29                                 |          |          | 1SS133         | DIODE                     |               |           |
| D50,51                              |          |          | HSS104         | DIODE                     |               |           |
| D50,51                              |          |          | 1SS133         | DIODE                     |               |           |
| D301-304                            |          |          | HSS104         | DIODE                     |               |           |
| D301-304                            |          |          | 1SS133         | DIODE                     |               |           |
| ED1                                 |          | *        | FIPT0BYM6      | INDICATOR TUBE            |               |           |
| IC1,2                               |          |          | TA8409S        | IC(MOTOR CONTROL)         |               |           |
| IC3                                 |          |          | BA6198FP       | ANALOGUE IC               |               |           |
| IC4                                 |          |          | CXA1782BQ      | MOS-IC                    |               |           |
| IC5                                 |          |          | UPD78044AGF121 | MI-COM IC                 |               |           |
| IC6                                 |          | *        | CXD2508AQ      | MOS-IC                    |               |           |
| IC7                                 |          |          | NUM4565D       | IC(OP AMP X2)             |               |           |
| Q1                                  |          |          | 2SB1370        | TRANSISTOR                |               |           |
| Q1                                  |          |          | 2SB1375        | TRANSISTOR                |               |           |
| Q2                                  |          |          | 2SC1740S(Q,R)  | TRANSISTOR                |               |           |
| Q3                                  |          |          | 2SA1534A(R,S)  | TRANSISTOR                |               |           |
| Q4                                  |          |          | DTA124ES       | DIGITAL TRANSISTOR        |               |           |
| Q4                                  |          |          | UN4112         | TRANSISTOR                |               |           |
| Q5                                  |          |          | 2SA954(L,K)    | TRANSISTOR                |               |           |
| Q6                                  |          |          | 2SB1167(R,S)   | TRANSISTOR                |               |           |
| Q7                                  |          |          | 2SC1740S(Q,R)  | TRANSISTOR                |               |           |
| MECHANISM (X92-1930-10/X92-1960-51) |          |          |                |                           |               |           |
| 1                                   | 3B       |          | A10-3121-32    | CHASSIS ASSY              |               |           |
| 2                                   | 1A       |          | A11-1048-02    | SUB CHASSIS               |               |           |
| 3                                   | 1A       |          | A11-1017-12    | SUB CHASSIS               |               |           |
| DM                                  | 2B       |          | A11-1038-08    | TT CHASSIS ASSY           |               |           |

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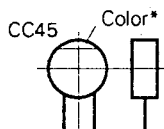
Δ indicates safety critical components.

## PARTS LIST

### CAPACITORS

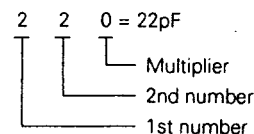
CC 45 TH 1H 220 J  
1 2 3 4 5 6

- 1 = Type ... ceramic, electrolytic, etc.      4 = Voltage rating  
2 = Shape ... round, square, ect.          5 = Value  
3 = Temp. coefficient                              6 = Tolerance



#### Capacitor value

- 010 = 1pF  
100 = 10pF  
101 = 100pF  
102 = 1000pF = 0.001μF  
103 = 0.01μF



#### Temperature coefficient

| 1st Word | C     | L   | P      | R      | S     | T    | U      |
|----------|-------|-----|--------|--------|-------|------|--------|
| Color*   | Black | Red | Orange | Yellow | Green | Blue | Violet |
| ppm/°C   | 0     | -80 | -150   | -220   | -330  | -470 | -750   |

| 2nd Word | G   | H   | J    | K    | L    |
|----------|-----|-----|------|------|------|
| ppm/°C   | ±30 | ±60 | ±120 | ±250 | ±500 |

Example : CC45TH = -470 ± 60ppm/°C

#### Tolerance (More than 10pF)

| Code | C     | D    | G  | J  | K   | M   | X          | Z          | P          | No code   |
|------|-------|------|----|----|-----|-----|------------|------------|------------|---|
| (%)  | ±0.25 | ±0.5 | ±2 | ±5 | ±10 | ±20 | +40<br>-20 | +80<br>-20 | +100<br>-0 | More than 10μF -10 ~ +50<br>Less than 4.7μF -10 ~ +75 |

#### (Less than 10pF)

| Code | B    | C     | D    | F  | G  |
|------|------|-------|------|----|----|
| (pF) | ±0.1 | ±0.25 | ±0.5 | ±1 | ±2 |

#### Voltage rating

| 2nd word<br>1st word | A    | B    | C    | D    | E    | F    | G    | H    | J    | K    | V  |
|----------------------|------|------|------|------|------|------|------|------|------|------|----|
| 0                    | 1.0  | 1.25 | 1.6  | 2.0  | 2.5  | 3.15 | 4.0  | 5.0  | 6.3  | 8.0  | -  |
| 1                    | 10   | 12.5 | 16   | 20   | 25   | 31.5 | 40   | 50   | 63   | 80   | 35 |
| 2                    | 100  | 125  | 160  | 200  | 250  | 315  | 400  | 500  | 630  | 800  | -  |
| 3                    | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | -  |

#### Chip capacitors

- (EX) C C 7 3 F S L 1 H 0 0 0 J  
1 2 3 4 5 6 7  
(Chip) (CH, RH, UJ, SL)
- (EX) C K 7 3 F F 1 H 0 0 0 Z  
1 2 3 4 5 6 7  
(Chip) (B, F)
- Refer to the table above.  
1 = Type  
2 = Shape  
3 = Dimension  
4 = Temp. coefficient  
5 = Voltage rating  
6 = Value  
7 = Tolerance

#### Dimension (Chip capacitors)

| Dimension code | L         | W          | T              |
|----------------|-----------|------------|----------------|
| Empty          | 5.6 ± 0.5 | 5.0 ± 0.5  | Less than 2.0  |
| A              | 4.5 ± 0.5 | 3.2 ± 0.4  | Less than 2.0  |
| B              | 4.5 ± 0.5 | 2.0 ± 0.3  | Less than 2.0  |
| C              | 4.5 ± 0.5 | 1.25 ± 0.2 | Less than 1.25 |
| D              | 3.2 ± 0.4 | 2.5 ± 0.3  | Less than 1.5  |
| E              | 3.2 ± 0.2 | 1.6 ± 0.2  | Less than 1.25 |
| F              | 2.0 ± 0.3 | 1.25 ± 0.2 | Less than 1.25 |
| G              | 1.6 ± 0.2 | 0.8 ± 0.2  | Less than 1.0  |

### RESISTORS

#### Chip resistor (Carbon)

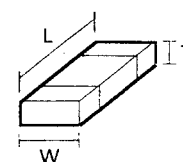
- (EX) R K 7 3 E B 2 B 0 0 0 J  
1 2 3 4 5 6 7  
(Chip) (B, F)

#### Carbon resistor (Normal type)

- (EX) R D 1 4 B B 2 C 0 0 0 J  
1 2 3 4 5 6 7

- 1 = Type    5 = Rating wattage  
2 = Shape    6 = Value  
3 = Dimension                                    7 = Tolerance  
4 = Temp. coefficient

#### Dimension



#### Dimension (Chip resistor)

| Dimension code | L         | W          | T         |
|----------------|-----------|------------|-----------|
| E              | 3.2 ± 0.2 | 1.6 ± 0.2  | 1.0       |
| F              | 2.0 ± 0.3 | 1.25 ± 0.2 | 1.0       |
| G              | 1.6 ± 0.2 | 0.8 ± 0.2  | 0.5 ± 0.1 |

#### Rating wattage

| Code | Wattage | Code | Wattage | Code | Wattage |
|------|---------|------|---------|------|---------|
| 1J   | 1/16W   | 2C   | 1/6W    | 3A   | 1W      |
| 2A   | 1/10W   | 2E   | 1/4W    | 3D   | 2W      |
| 2B   | 1/8W    | 2H   | 1/2W    |      |         |

# DP-R49

## SPECIFICATIONS

|                        |                         |
|------------------------|-------------------------|
| Laser .....            | Semiconductor laser     |
| Playing rotation ..... | 200 rpm ~ 500 rpm (CLV) |
| Wow & Flutter .....    | Unmeasurable Limit      |

[General]

Dimensions .....W: 360 mm (14-3 /16")  
H:109 mm (4-5/16")  
D:415 mm (16-5/16")  
Weight (net) .....4.0 kg (8.8lb)

KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

**Note:**

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on the General market(M) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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